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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/004,575	12/04/2001	Michael J. Collins	1700.89A	6616

21176 7590 10/23/2002

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EXAMINER

GAKH, YELENA G

ART UNIT	PAPER NUMBER
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1743

DATE MAILED: 10/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/004,575	Applicant(s) COLLINS, MICHAEL J.	
	Examiner Yelena G. Gakh, Ph.D.	Art Unit 1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☒ Claim(s) 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Application is Divisional of US Application 09/603,487, filed on 06/23/00. Claims 1-42 are pending in the Application.

Claim Objections

2. Claim 18 is objected to because of the following informalities: it is numbered as claim 8. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 3, 20, and 30 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification does not enable anyone of ordinary skill in the art to determine the fat and oil content in the sample by measuring chemical shifts of the protons in the sample and comparing them with the standards. Only integral intensities of the signals can provide information on the fat and oil content of the sample, if the quantitative analysis is meant here.

Regarding claims 8 and 22, the specification does not enable anyone of ordinary skill in the art to keep the sample at a substantially constant temperature during the step of drying the sample, because drying the sample requires raising its temperature.

5. Claims 1-42 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for drying the sample by subjecting it to a microwave radiation, does not

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reasonably provide enablement for any other type of electromagnetic radiation, such as e.g. UV, NIR, NMR, EPR, etc. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. Heating (or drying) a sample by applying electromagnetic radiation in the microwave range is a well-known technique, while most of other ranges of electromagnetic radiation are not applicable for this purpose.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 17 and 28 recite determination of the “fat and oil content in the sample”. Measurement of relaxation times, recited in claims 2, 19 and 29, can provide a total amount of fats and oils in the sample. However, measurement of chemical shifts recited in claims 3, 20, and 30, can provide only approximate qualitative analysis concerning types of fats present in the sample. This would not be a quantitative analysis.

Claims 2, 19 and 29 are not definite as to how the relaxation times (and which ones - T1 or T2) are measured? Are they measured directly from FID, or by applying inversion-recovery sequence? These would involve completely different steps in the method.

In claims 3, 20, and 30 it is not quite clear, what does “measuring the chemical shift spectrum of the sample” mean? Does it mean, “measuring the chemical shifts of the protons in the sample”? Or does it mean, “measuring integral intensities of the proton signals in the NMR spectrum of the sample”?

It is not clear from claims 10, 17, 24 and 40 if the sample and the sample pad are transferred separately to the NMR analyzer. It seems that the claim was meant to recite “transferring the complete sample **on** the sample pad”. It is suggested to replace “and” with “**on**” in all expressions reciting, “the sample and the sample pad” in all claims, since it makes more sense.

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Claim 28 is incomplete as omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: reweighing the sample after its drying for determining the water content in the sample, which is important for determining the fat and oil content in the sample. Otherwise, incorrect results on the fat and oil content will be calculated from the NMR spectra, since the amount of the dried sample will not be known before the NMR analysis.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. **Claims 1-7, 9-10, 13-14, 17-21, 25-30, and 34-40** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kock GB 2,261,072, IDS) in view of Collins (US 4,554,132).

Kock teaches determination of the fat or oil content of substances with high water content, in particular of food, with a low resolution NMR spectrometer by measuring relaxation times. Prior to the NMR measurement, the substance is mixed with a chemical drying agent. Kock in description of the prior art explains that “the determination of the fat content by means of a nuclear magnetic resonance pulse spectrometer of low spectral resolution with a magnetic field strength of maximum about 1T and an average homogeneity of about 10^{-5} across the sample

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volume and as a result with a proton resonance frequency lower than about 50 MHz ... is not possible with products with a water content of, for example, more than 13% because of the overlap of water and fat signals, since at a higher water content the contribution of the water to the total signal increases highly over proportionally” (p. 1, lines 12-25). “In order to perform such determinations with a low resolution device, it has been necessary hitherto to eliminate the water by pre-drying in an oven, for example in a drying oven, a vacuum oven, a **microwave oven** or the like” (p. 2, lines 13-17).

Kock does not specifically disclose placing a sample on a sample pad transparent to microwave radiation and with features recited in claim 6, and drying the sample with electromagnetic radiation, weighing the sample on the sample pad before and after drying procedure.

Collins teaches a method for determination volatiles and solids in a sample using microwave heating and electronic balance weighing of fat or oil samples. The method comprises placing the sample on a sample pad transparent to microwave radiation and free of protons, of low mass, porous, hydrophilic and lipophilic (e.g. glass fiber filter (col. 5, line 5)), weighing the sample on the sample pad before and after drying, and calculating percentage of moisture, and fat and oils in the sample.

It would have been obvious for anyone of ordinary skill at the time the invention was made to use microwave radiation for preliminary drying moisture-containing oil or fat sample for its following analysis with low-resolution proton NMR spectroscopy by determining relaxation times of the sample, as disclosed by Kock, because Kock demonstrated the necessity of drying moisture-containing sample of oil and fat before its NMR analysis to perform such analysis. It would have been obvious to use microwave radiation for drying the sample, because this is a standard technique for drying samples, and because Collins disclosed a very convenient way of drying and weighing the sample in the same place in microwave without transferring it, which improves the accuracy of the method. It would have been obvious for anyone of ordinary skill to calculate the moisture content as disclosed by Collins and the fat content, as disclosed by Kock, because these are complimentary calculations, which give a complete picture of the original content of the sample, and because Kock’s NMR method provides the most accurate results regarding the fat and oil content. It would have been obvious for anyone of ordinary skill in the

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art to partially melt at least a portion of the fat and oil in the sample and keep an increased temperature in the NMR spectrometer, because this gives better resolution of the NMR spectrum.

11. **Claims 11-12, 24-25, and 41-42** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kock in view of Collins as applied to claims 1-7, 9-10, 13-14, 17-21, 25-30, and 34-40 above, and further in view of Jerosch-Herold et al. (US 5,289,124).

Kock in view of Collins fail to teach using wrapping the sample on the pad with a Teflon wrapping sheet.

Jerosch-Herold teaches permeability determination from NMR relaxation measurements for fluids in porous media by placing samples (sandstone core plugs) in a sealed container and imbibing with water for several hours, followed by sealing the samples with Teflon tape and transferring into NMR glass tube for measurements.

It would have been obvious for anyone of ordinary skill to use Teflon wrapper for dried samples in Kock-Collins method, as taught by Jerosch-Herold, because in both cases the Teflon wrapper seals the sample and prevents absorbing additional water or losing moisture content of the sample, and because Teflon wrapper is the most suited for proton NMR relaxation studies as well as for microwave heating, because it both is stable to heating and does not give proton NMR signals.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yelena G. Gakh, Ph.D. whose telephone number is (703) 306-5906. The examiner can normally be reached on 10:00am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (703) 308-4037. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7165 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


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YG

October 21, 2002


Jill Warden
Supervisory Patent Examiner
Technology Center 1700